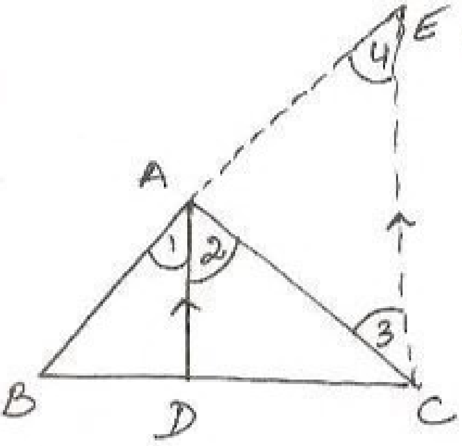
Ex 6.6

(9)



given - In figure
$$\frac{BD}{CD} = \frac{AB}{AC}$$

To prove AD is bisector of $\angle BAC$

Const - draw CE ∥ DA intersecting BA produced in E

Proof AD ∥ EC

$\therefore \angle 1 = \angle 4$ ...(i) [corres. ∠s]

$\angle 2 = \angle 3$ ...(ii) [alternate in. ∠s]

In △BCE, DA ∥ CE

$\therefore \frac{BD}{CD} = \frac{BA}{AE}$ [basic prop th.]

But $\frac{BD}{CD} = \frac{AB}{AC}$

$\therefore \frac{\cancel{AB}}{AE} = \frac{\cancel{AB}}{AC}$

$\Rightarrow AE = AC$

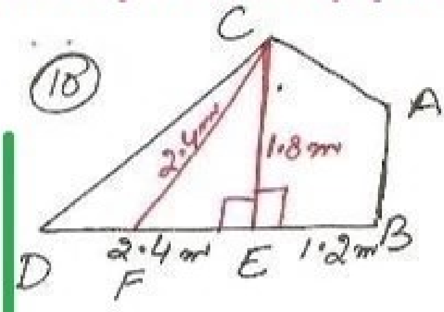
$\Rightarrow \angle 3 = \angle 4$ [isos. △ prop] ...(iii)

From (i), (ii), (iii)

$\angle 1 = \angle 2$

$\Rightarrow$ AD bisects $\angle BAC$

(10)



Sol In rt. △DEC

$CD^2 = CE^2 + DE^2$ (Py. th.)

$= 1.8^2 + 2.4^2$

$= 3.24 + 5.76$

$= 9$

$CD = \sqrt{9}$

$= 3m$

decreased length of string $= 3 - \frac{12 \times 5}{100}$

$= 2.4m$

In rt △FEC

$FE^2 = CF^2 - CE^2$ (Py th.)

$= 2.4^2 - 1.8^2$

$= (2.4 - 1.8)(2.4 + 1.8)$

$= .6 \times 4.2$

$FE = \sqrt{.6 \times .6 \times 7}$

$= .6 \times 2.65$

$= 1.59m$

Total hor. distance

$= 1.2 + 1.59$

$= 2.79m$